THE FUTURE OF ELECTRIC VEHICLES IN INDIA
FEBRUARY2022

A GBS KNOWLEDGE PERSPECTIVE

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Compiled by Guidant Business Solutions

Introduction

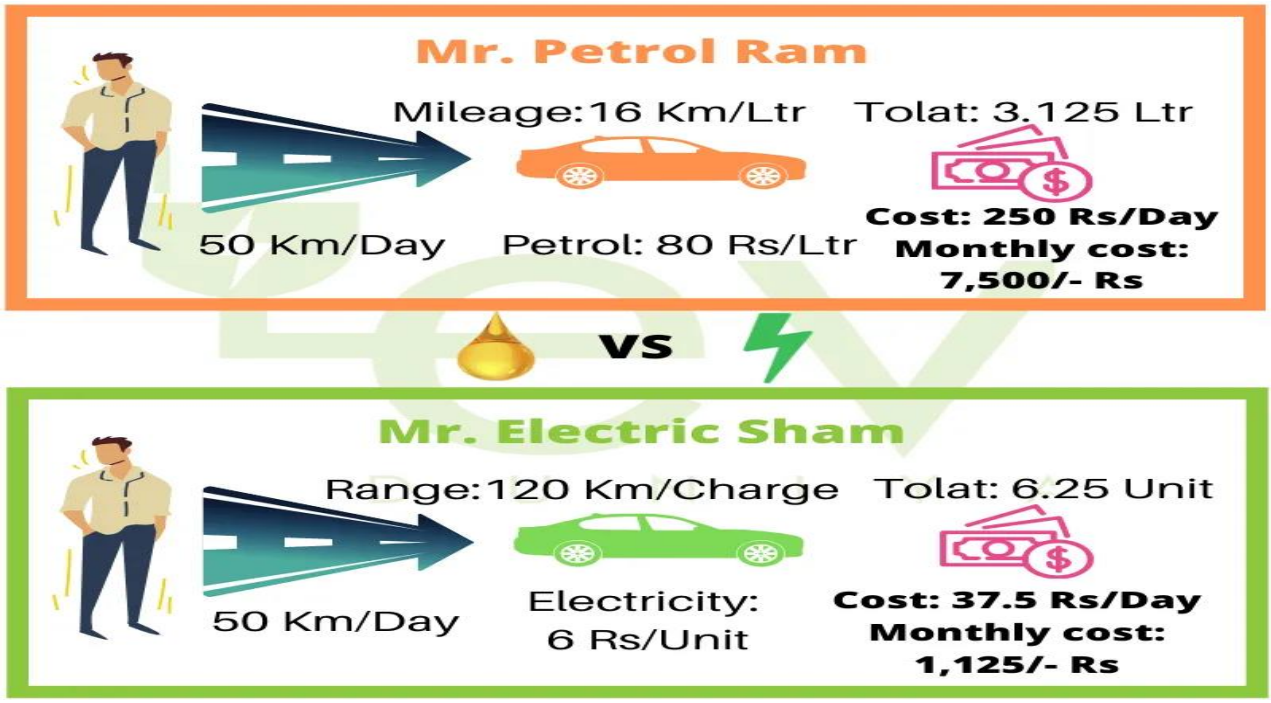
The electric vehicle industry in India is a growing industry. The central and state governments have launched schemes and incentives to promote electric mobility in the country and some regulations and standards are also in place.

While the country stands to benefit in a large way by switching its transport from IC engines to electric motor-powered, there are challenges like lack of charging infrastructure, high initial cost and lack of electricity produced from renewable energy. Still, e-commerce companies, car manufacturers, app-based transportation network companies and mobility solution providers have entered the sector and are slowly building up electric car capacity and visibility. The Government started Faster Adoption and Manufacturing of Hybrid and Electric vehicles (FAME) scheme which provides incentives for purchasing electric vehicles.

The coming decade is anticipated to be the ultimate decade for the future for electric cars in India. With battery amount reportedly falling up to 73%, electric-powered vehicles are anticipated to be as reasonably-priced as gas-powered vehicles within the foreseeable future.

The Indian Automobile Industry is currently ranked 5th largest in the world and is set to be the 3rd Largest by 2030. The requirement of mobility in India is set to change dramatically in the near future to cater to the requirement of 1.30 billion+ population.

A major push towards EVs will be led by the public transportation requirements in India – Fleet cars, E-Buses,3 wheelers, and 2 wheelers. Personal vehicle options for EVs will still be a relatively smaller element in the whole pie.
Finally, electrification will lessen vehicular emissions, a key contributor to air pollutants which reasons an average of **3%** GDP loss each year.



Foreword

Ravi Shankar Srivastava

Managing Partner – Client Acquisition & Entrepreneurial Development

Eco System and renewable energy is the current and will be the future. The natural resources are drying up and the crude price are denting the country's economy. Hence the alternative source of future is Electric Vehicle, which is an economical, pollution free and low maintenance. India is thriving through to integrate, alot of tax exemption through EV and facing the old vehicle issue and giving scarp incentive to buy new EV. PLI Schemes and subsidiary will be helpful in longer run. One can see Ola EV scooter , Tesla EV vehicle and Tata EV are in good demand. The only resistance for EV is raw material, technology which can give EV high mileage and visibility of easy accessible charging station. We can drive great optimization and pollution free environment system.

Jaykumar Acharya

Managing Partner – Leadership & Process Expert

India is a bustling nation. India is being watched by world majors, not only for its consumerism, but also for it's thrust on Exports and it's transition to sustainable and renewable energy sources. India is transforming in a manner, so as to lead the world to the Green Energy revolution. Based on it's commitments made at various forums. India is keen to drive out IC engines and substitute them with Electric-power. The EV marketplace in India is something to watch our for, especially with so much being driven by the Centre. This paper examines the massive potential in this space and will act as a reckoner for entrepreneurs who want to get into this space and thrive on the early mover advantage. The big players in the market have already their R&D efforts. More in this paper. Happy reading to you !!

Shardul Srivastava

Managing Partner – Client Relations & Start-Up Cell

EV is here to revolutionize the automotive industry. Though the pandemic shook the automobile industry but EV's have managed to attain a steady demand in recent times. The industry is for sure on an upward major trajectory and India is seriously looking at a carbon free future. This transition will be heavily supported by the upgradation of technology & infrastructure, the way regulations are laid down and sentiments of consumer behavior. The entire mobility ecosystem is responsible to make this transformation successful. With the growth in the EV sector other relevant ancillaries sectors will also see a growth in demand for raw materials. Am sure Electric Vehicles growing popularity and utility is preparing for a future where there value goes far beyond transportation.

Market Overview

The India electric vehicle market was valued at USD 5.47 Billion in 2020, and it is expected to reach USD 17.01 Billion by 2026, growing at a CAGR of 23.47% over the forecast period (2021-2026)

The COVID-19 epidemic affected the auto sector, and demand for electric automobiles, two-wheelers, and three-wheelers suffered as a result of the disruption. According to the Society of Electric Vehicle Manufacturers (SMEV), total electric vehicle registrations fell 20% in FY21 to 236,802 units, down from 295,683 in FY20. However as the sales of EVs are picking up, the market is expected to register positive growth during the forecast period

Study Period:	2018-2027
Base Year:	2021
CAGR:	>23.4 %

MARUTI SUZUKI TOYOTA Mahindra TATA MOTORS

In February 2020, the Union Transport minister inaugurated India's first inter-city electric bus service. These buses were manufactured by Mitra Mobility Solution, with a range of 300 km on a full charge.

Many local bus manufacturers who are in collaboration with some Chinese manufacturers are trying to cater to the rising demand for electric buses in India. For instance,

Olectra Greentech, India's largest manufacturer of electric buses, announced with an investment of more than Rs 600 crore is setting up the country's biggest electric bus factory with a capacity of 10,000 units in Hyderabad.

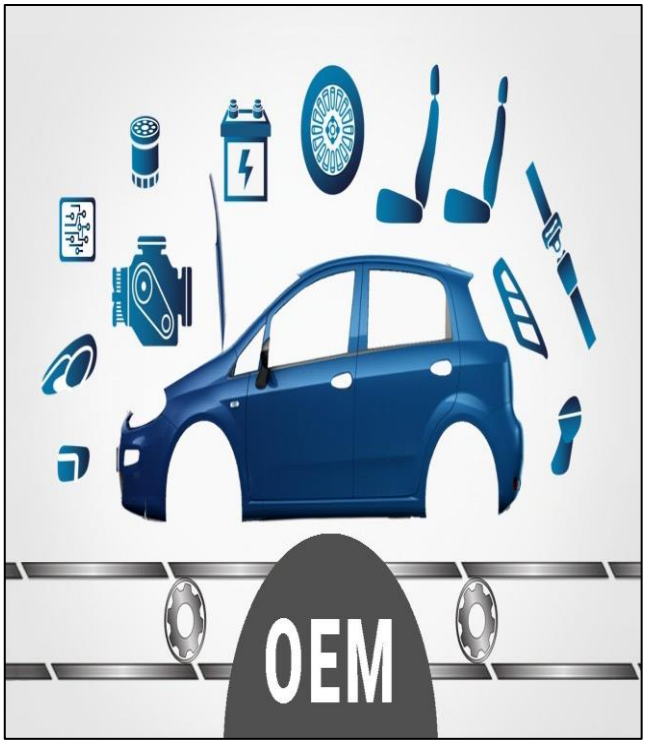
India Electric Vehicle (EV) Market, Revenue Share (%), By Vehicle Type, 2020

Source: https://www.mordorintelligence.com/industry-reports/india-electric-vehicle-market

Impact of EV on Other Industries

Lithium-Sulfur battery industry:

The biggest benefits of an electric vehicle revolution will be seen in the automobile OEMs industry. More specifically, companies that develop batteries for electric vehicles are set to see a huge upturn in the adoption of these vehicles worldwide Battery technology is stronger than ever, with governments across the world offering incentives to manufacturers who can improve battery storage capacity and performance. The mass production and acceptance of electric vehicles feel like an inevitable step in human history. A recent study showed that if global sales of EVs touch 8 million vehicles as much as $60 billion worth of batteries will have to be sold to cater to this volume. This will be a clear shift of value from crude oil. Today, there are more incentives for battery makers to invest in R&D to improve battery storage capacities and performance efficiencies than ever before.



Automotive OEMs:

While newer EV players will face significant entry barriers in terms of brand and sales and service networks, established players will have no choice but to offer EVs. Some have already announced plans to switch to only EVs within the next decade. With EVs, preventive maintenance becomes an easier proposition as all moving and stationary parts can be monitored in real-time with lesser effort. This will improve customer experience for drivers and open up a new revenue stream in the form of utilization data generated. While the list of beneficiaries is a long one, there are challenges to be addressed. With the passage of time and more R&D, it's going to be a long patch of sunshine for EV stakeholders.

Impact of EV on Other Industries

EV charging infrastructure:

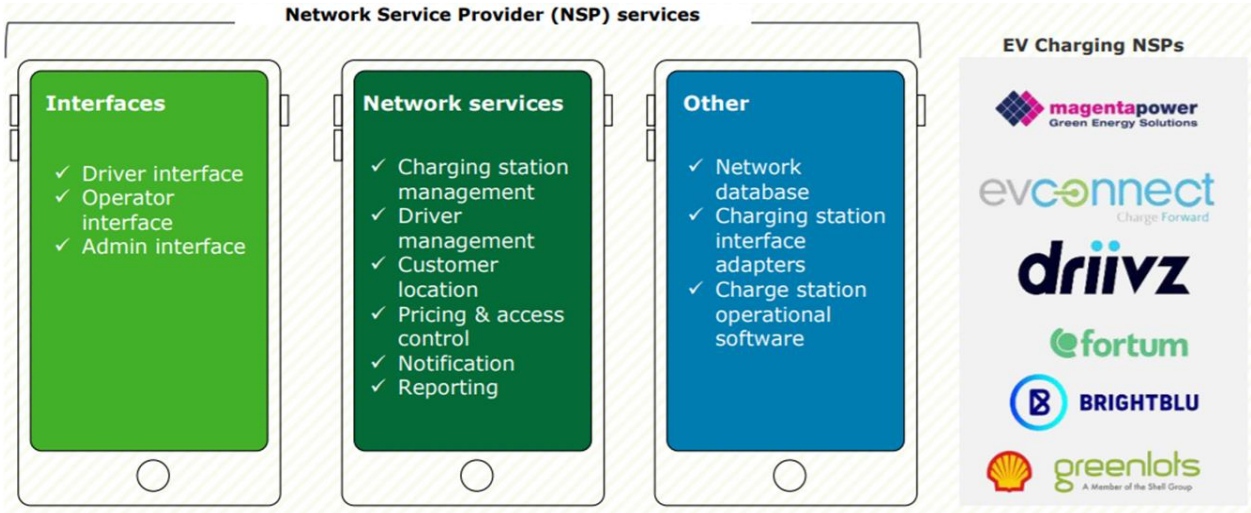
Office or commercial building managers and property owners should think of adding EV chargers to their properties. The players in the market who make the first move can reap the many benefits. Having EV Charging stations at properties will draw new EV owners and retain the tenants who are moving to electric bikes and cars. Installing EV charging stations at a multi-resident apartment property communicates to the tenants that their property management prioritizes environmentally friendliness and excellent amenities. Thus, this contributes to an environment-friendly image that further draws and engages tenants. Businesses that offer commercial EV charging stations in India may easily draw and retain employees who would prefer to charge their EV during the workday. It can signal that their employer is aligned to niche requirements and committed to green, sustainable solutions.

Pet film manufacturers

The plastics for electric vehicle market is projected to grow at a CAGR of 26.9% to reach a market size of USD 2,621 million by 2025 from USD 767 million in 2020. The rising trend for replacement of metals with plastics in interior components is contributing the increase in demand of plastics for interior trim segment. The replacement of metal parts with plastics allows lower risk at the time of crash or accident as these plastics act as a absorbing body especially on the legs of vehicle occupant at the time of crash. The stringent emission regulation and government favorable policies towards adoption of electric cars are the major factors driving the sales of electric vehicles and thereby bolstering the demand of plastics for electric vehicle.

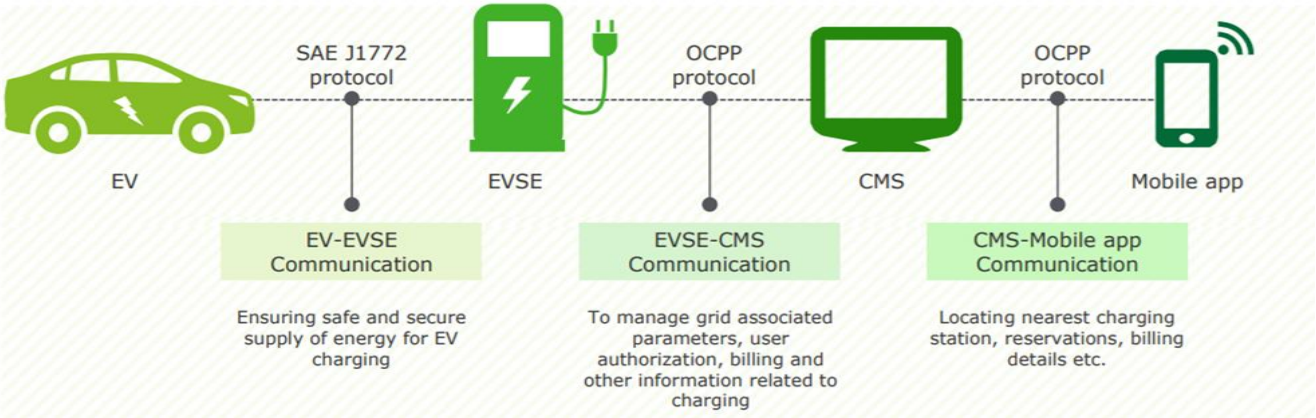
IT infrastructure for EV charging station

Suitable backend IT infrastructure is highly crucial for seamless operation of EV charging station. A Network Service Provider (NSP) is the responsible entity for managing and operating network related services for Status charging stations. Such an entity enables cloud based access of information regarding EV charging, location of charger, types and numbers of chargers and other details.



Govt. of India has mandated Charging station operators to tie up with at least one online Network Service Provider (NSP):

- Govt. of India has mandated Charging station operators to tie up with at least one online Network Service Provider (NSP).
- Other than EV and EVSE, there are two other vital components that remotely access the information at charging station viz.
- CMS (Central Management System) and mobile apps. CMS is a cloud based backend system managed by the EVSE operator.
- It communicates with EVSE to manage user authorization, billing and rate of charging.
- The CMS also enables end-users to find nearest charging stations, reserves a charging slot and pay.
- Mobile applications are utilized for remotely accessing information about nearest charging station, its availability, operating status, etc.



EV towards Sustainability

Our yearning for luxurious cars, comfortable 2-wheelers is ever increasing. Transportation is a major source of greenhouse gas emissions and as a result, increases global warming. The life of the natural environment and its organisms – humans, animals, plants are at stake. Slow your climatic changes ~ Reduce greenhouse emissions The world came to a conclusion – electric vehicles for a sustainable green future. Wherever the electricity comes from zero-carbon sources such as solar, hydro, and wind you're a real solution to the climate crisis.

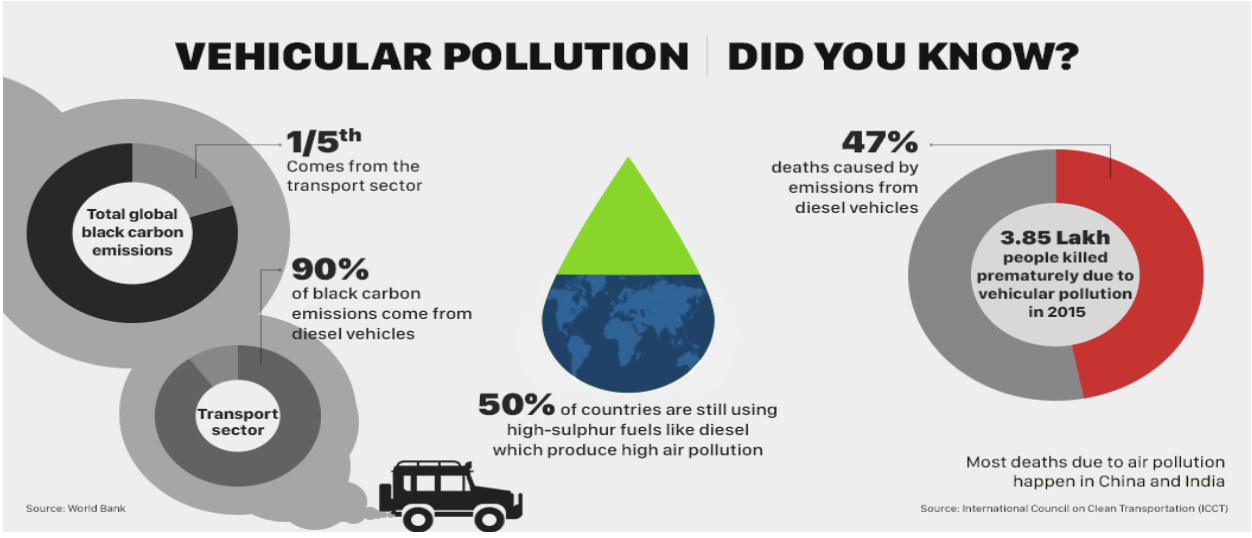
Just by owning an EV, you can eliminate air pollution. Air pollution is a climatic concern, so is noise caused by combustion engines. You don't let people hear your presence. You are one step closer to save the environment for your kids. EVs have environmental benefits as compared to hybrids or even internal combustion engine vehicles as they can help minimize noise levels, pollution, and greenhouse gas emissions.

Not only that, the presence of electric cars reduces the volume of fuel imports. As fuel consumption continues to increase along with the growth in the number of motorized vehicles as well as the strengthening of highway infrastructure, the price of fuel is skyrocketing.

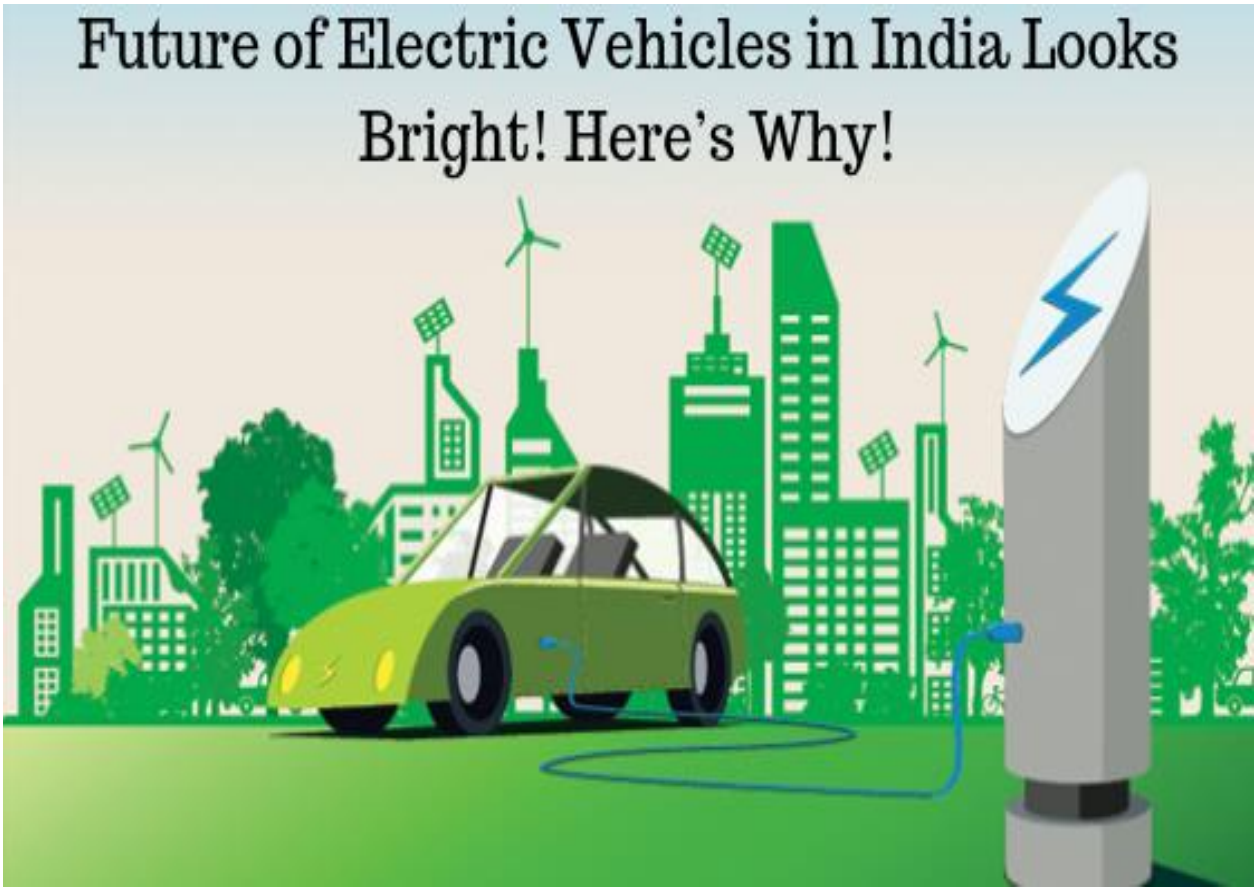
India is dependent on middle-east for fuel. An increase in EVs will reduce fuel dependency. In turn, the government can utilize the import cost for the future development of the country leading to a sustainable future. In order to realize the government's target of 30 % EV penetration by 2030, utilities have invested in grid up-gradation and the development of publicly available fast-charging stations to support the planned EV growth.

When people drive ICE most of the money spent on fuel is utilized by the country it is imported from. On contrary, if you own an electric vehicle, the electricity used to charge your EV battery is generated in India itself and around 50% is now renewable.

Sustainability doesn't only stand for our own sustainable future. It relates to the wise utilization of the country's resources for its own benefit. Electric vehicles are the backbone of India's economic growth. The amount spent on building EV charging stations goes back to our own country as we have thousands of startups to manufacture them in-house. India is now the largest manufacturer of electric 2-wheeler startups.



Source : https://www.charzer.com/blog/2021/11/29/how-can-electric-vehicles-contribute-to-a-sustainable-future/



India is the fifth largest car market in the world and has the potential to become one of the top three in the near future — with about 40 crore customers in need of mobility solutions by the year 2030. That is one side of the coin. The other side is that the country needs a transportation revolution. The current trajectory of adding ever more cars running on expensive imported fuel and cluttering up already overcrowded cities suffering from infrastructure bottlenecks and intense air pollution is unfeasible. India's cities will choke. A transportation revolution will have many components — better "walkability", public transportation, railways, roads — and better cars. Many of these "better cars" will likely be electric.

The transition to electric mobility is a promising global strategy for decarbonising the transport sector. India is among a handful of countries that supports the global EV30@30 campaign, which aims for at least 30 per cent new vehicle sales to be electric by 2030. Prime Minister Narendra Modii's advocacy of five elements for climate change — "Panchamrit" — at the recently concluded COP26 in Glasgow is a commitment to the same. The PM espoused various ideas, like renewable energy catering to 50 per cent of India's energy needs, reducing carbon emission by 1 billion tonnes by 2030 and achieving net zero by 2070, so that future generations can lead secure and prosperous lives.

Source : *https://economictimes.indiatimes.com/news/economy/policy/will-bring-out-battery-swapping-policy-fm-nirmala-sitharaman-says/articleshow/89266746.cms*

Ravneet Singh Phokela (Chief business officer of Ather Energy):

India is to see greater adoption of electric mobility, the nascent but growing electric vehicle (EV) market in the country needs many more EV manufacturers and plenty of new product. The bulk of the e-two-wheeler demand came from low-speed models in FY21 and competitive marketplace will drive the sales growth, its estimated there are around 25 electric two-wheeler OEMs in India.

Randheer Singh (Director of Electric Mobility in NITI Aayog):

We have to understand a few things before we talk about the shift to green mobility. What are the dynamics in our country? Indian trajectory of change to green mobility is going to be very different than whatever is in the west. We are almost 81% two-wheeler market with around 3% three-wheeler market. So in India, the market is being led by the e-rickshaws. Almost two million e-rickshaws are plying.

Tarun Garg (Director of Sales in Hyundai Motors India):

Range and charging infrastructure plays a major role in attracting EV customers by three major factors for it, the range of distance, the charging infrastructure and affordability. The first thing people look for in an EV is the range. On an average, an Indian is driving no more than 30kms per day, which makes for a mere 1000kms per month. For charging and affordability, they do provide an independent charging source, but there is some work, which needs to be done to make the vehicle affordable.

Sohinder Gill (CEO of Hero Electric):

Over the last few months, we have seen an uptick in the demand for EVs. At Hero, we are dedicated to transforming mobility and elevating the EV two-wheeler ownership experience for our customers through our various endeavors. Further simplifying two-wheeler ownership, we are expanding personalized funding options, thus facilitating convenient purchase decisions. With the growing demand, we aim to take EVs to non-tier1 cities and rural pockets to electrify Indian roads. This collaboration will drive forward our journey to strengthen green mobility across key markets.

Sulajja Firodia Motwani, founder and CEO of Kinetic Green :

In the long-term, the electric vehicle market in India looks stable. We have a unique market and also the largest pool of two and three-wheeler market. If we could electrify those segments, we could put millions of EVs on the road. This could save a lot in terms of pollution and also create a large ecosystem in India for EV and its components. We can really become Atmanirbhar, and also become global suppliers for EV.

Mahesh Babu Former Mahindra Electric MD & CEO :

The race to electric has only just begun, and we are only at the start of the start. As the nascent electric vehicle ecosystem is beginning to see some action in India with recent launches from players such as Tata Motors, Hyundai Motor India, and MG Motor India, the pioneer of e-mobility in the country, Mahindra Electric believes that it is not lagging behind but rather working with a long-term vision to prosper when EVs really see an inflection point in the coming two to three years' time in the personal mobility space.

The global EV industry has significantly evolved over the last decade led by China, followed by other major automobile markets. China leads the group, in terms of the number of EVs and model variants (200+), developed vendor ecosystem, charging infrastructure and battery cell manufacturing capabilities, which has resulted in economies of scale benefits and thereby affordable pricing compared to other markets.

India, however, lags considerably in terms of EV penetration, compared to other larger markets and much still needs to be done as far as the number of models, charging infrastructure, developing vendor ecosystem and providing financial incentives are concerned. The country has a negligible share in EVs, even though we are the largest 2W and 3W market globally and amongst the top five in commercial vehicles (CV) and passenger cars.

That said, the scope for growth is encouraging in the electric two and three-wheeler segment, followed by the electric bus segment due to favourable total cost of ownership (TCO) and huge volumes, which translate into economies of scale benefits. EVs have been slowly gaining acceptance (0.93 million EVs have been registered in India since FY2012), mainly e-3Ws/e-2Ws.

The sales of e-3Ws contracted 20 % YoY in FY2021 (to 88,378 vehicles) while e-2W and electric cars grew over 60 % YoY. E-2W registration picked up in 10M FY2022 because of the rising fuel prices and lower ownership cost of e2Ws over ICE. The segment witnessed growth of over four times on a YoY basis, and 149,204 e-2Ws were sold in 10M FY2022. The penetration of e-buses in India is also gradually picking up, with about 400 units sold in FY2021 and approximately 858 units in 10M FY2022.

Keeping this in mind, the Union Budget for 2022-23 has reiterated on promoting electric vehicles, as a means of transportation in the country. In addition to existing financial incentives under the FAME-II scheme (Rs. 10,000 crore) to boost demand and the PLI Schemes for ACC (Rs. 18,100 crore) and auto segment focused on EVs and other alternative energy technologies (Rs. 25,938 crore), the finance minister in the Budget announced plans to implement a battery swapping policy and formalize interoperability standards. Battery swapping is likely to gain acceptability in commercial applications like e2W and e3W and will help faster penetration in these segments, if implemented effectively. Further, this move will also help battery manufacturers to reduce cost through economies of scale.

The finance minister also announced plans to further the push for EV penetration in public transport and create special mobility zones for EVs. This has been implemented in other regions like China and Europe to promote EVs, and will aid in increased EV adoption, in addition to allocations under FAME II scheme. The inclusion of energy storage systems in the harmonised List of Infrastructure will facilitate easier credit availability and cheaper financing availability for the EV segment.

There is also a proposal to reduce customs duty for Nickel Ore and Concentrates from 5 % to nil, ferro nickel from 15 % to 2.5 %, nickel oxide and hydroxide from 10 % to free. Nickel Manganese Cobalt is a key chemistry used in lithium-ion batteries, which are used in EVs. Given that nickel alloys are primarily imported, the reduction in customs duty will aid indigenous EV battery manufacturers in reducing production costs. Further, motors and controllers are critical EV components with moderate levels of localization currently. Reduction in customs duty from 10 % to 7.5 % in motor parts, will help also reduce the cost of EVs.

Overall, the Union Budget 2022-23 has been favorable for the EV space and will favour deeper penetration of green mobility over the medium term.

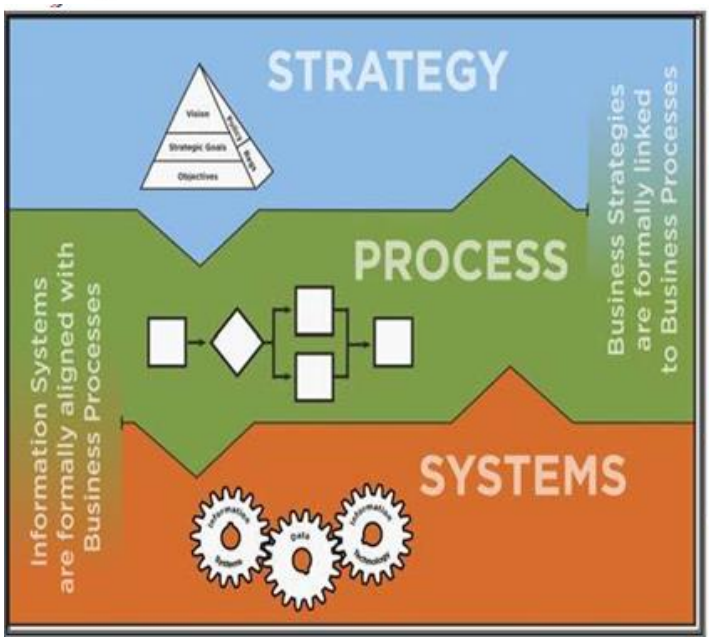
About Guidant Business Solutions

Guidant Business Solutions LLP is a team of **BUSINESS consultants** who are experts in the Mapping, Planning, Developing and Delivering the right solutions that ensure **guaranteed success.**

We specialize in the following Business Processes and Sub-processes -

Key Business Processes	Sub-Processes
1. Client Acquisition	Strategic Objective, Buss Need, Buss Dev, Marketing, Sales
2. Client Servicing	How will you ensure servicing the client?
3. Quality Mgmt	How will you ensure Quality of delivery to the client?
4. Operations	How are the various sub-processes integrated to ensure delivery?
5. Service Delivery (Int)	Details to which internal customer processes are developed
6. Outsourcing	The Make/buy Algoryhtm
7. Service Provider Mgmt	Managing Vendors, Suppliers, External Partners
8. Financial	Financial and Accounting Sub Processes
9. People	People Management Sub-processes
10. Logistics (I/O)	Inner/ Outward movement of tangible/ intangible items

Our Service Offerings.....



Business Process Assessment	- Assess Business Process Outlay - Ensuring 360 deg approach - Across business perspectives
Strategic Business Planning	- Defining the Business Strategy - Strategic Planning Workshop - Formulation of Action Plans
Business Turnaround Services	- Check Sub-optimization/ - Check Under-performance - Get business out of stress
Value Stream Mapping	- Understand the value chain - Mapping key processes - Ensures clarity in processes
Business Mentoring & Training	- Mentoring CEOs/CxOs - Intense dialogue with Leaders - Mentoring Plan (6- 2 months).
Business Plan Execution	- Aligning plan with strategy - Laying out implementation - Monitor implementation

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